

Final Report

Results of the FY 2000

Implementation Monitoring Program

Watershed-Scale Assessment of Compliance with Northwest Forest Plan Direction

March 2002



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Summary

The Fiscal Year 2000 Implementation Monitoring Program (the Program) was conducted in the 12 planning provinces covering the Northwest Forest Plan (the Plan) area. Two watersheds per province were selected, and these 24 watersheds were monitored. Program field reviews were led by either a Forest Service or Bureau of Land Management representative and attended by members of Provincial Advisory Committees, community leaders, industry and environmental representatives, federal agency specialists, and citizens from local communities. Participation in the reviews varied greatly; sometimes it was high, but participation by advisory committee members was generally low and declined somewhat from last year.

The watershed-scale Program was designed to gain a broader perspective on implementing the Plan's standards and guidelines than is possible with reviews of specific projects only. The report shows that data were collected that applied directly to implementing the standards and guides as well as other informational data. The questionnaire developed for this year's watershed review attempted to:

- Characterize the watershed (size, land allocations, types of activities).
- Determine how watershed analysis:
 - a. is used to guide consistency with Aquatic Conservation Strategy (the Aquatic Strategy) objectives;
 - b. contributes to developing strategies and priorities for restoring and monitoring watersheds; and
 - c. contributes to making decisions.
- Evaluate timber harvest and road decommissioning in Key Watersheds.
- Evaluate changes made to Riparian Reserve widths.
- Evaluate progress in developing road management or transportation plans for roads in Riparian Reserves.
- Determine how complete Late-Successional Reserve Assessments and the types of activities implemented in them.
- Provide an overview of the surveys and documentation of Survey and Manage species.

Program results showed that:

- Watershed analyses (WAs) were completed for 21 of the 24 sampled watersheds and two analyses were in the process of being completed .
- None of the watershed analyses had been updated.
- When Riparian Reserve widths were modified, it was accomplished at the project level, not at the watershed scale.

- Miles of system roads were reduced 4% (82.2 miles) for 13 Key Watersheds; and non-system roads were reduced 5.9% (11.3 miles) for six Key Watersheds.
- Road management or transportation plans have not been prepared for roads specifically in Riparian Reserves for any of the monitored watersheds.
- Assessments were completed for 19 of the 22 watersheds containing Late Successional Reserves. Assessments were ongoing in two of the remaining watersheds containing Late-Successional Reserves.
- Many projects were designed with specific Late-Successional Reserve objectives, but some were designed only to meet the guidelines.
- The hierarchy of land allocations are applied as directed in the Record of Decision.
- Fourteen of the fifteen watersheds sampled that contained Matrix allocations and addressed to the question about Matrix complied with the Standard and Guideline requiring retention of old-growth fragments in watersheds where little remains. Wildfire destroyed all except about 9% of the late-successional habitat in the other watershed.
- A high degree of variation was found in how the field units perceived and used the watershed analysis process to:
 - a. Report site-specific Aquatic Strategy compliance of projects, activities, and programs before and after the Record of Decision.
 - b. Provide adequate information for the decision maker to determine if proposed and certain existing projects, activities, and programs are consistent with Aquatic Strategy objectives.
 - c. Provide enough information for recreation projects, programs, or facilities planned, implemented, or both since 1994 for the decision-maker to determine that the project or management action meets or does not prevent attaining of the Aquatic Strategy objectives.
 - d. Provide evaluation and mitigation for existing recreation facilities and roads in Riparian Reserves, if any, to ensure they do not prevent and, to the extent practicable, contribute to attaining Aquatic Strategy objectives.

The results listed above indicate both a high degree of compliance with meeting the Standards and Guidelines and opportunities for improvement. None of the latter reveal the need to amend the plan or conduct major changes in the way the plan is being implemented, but rather the need to clarify and/or provide additional direction. We would like to acknowledge the excellent work of the Provincial Implementation Monitoring Teams in conducting the field reviews and preparing their individual reports.

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Introduction

The 2000 Northwest Forest Plan (the Plan) Implementation Monitoring (IM) program was designed to sample 24 randomly selected 5th-field watersheds (two per province) (Appendix A) in the Plan area to evaluate Forest Service and Bureau of Land Management land and resource management at the watershed scale. Specifically, the 2000 questionnaire (Appendix B) was designed to collect data on land ownership patterns, land allocations and their applications, watershed analysis, Key Watersheds, the Survey and Manage program, and Late-Successional Reserves.

Questionnaire data for 24 watersheds in the 12 Plan provinces were compiled and are summarized in the body of this report. Questions related specifically to compliance with standards and guides from the Record of Decision are summarized in Appendix B.

Program participants are listed in Appendix C.

Background and Purpose

The Plan, implemented in May 1994, requires federal natural-resource agencies to manage public-land resources on nearly 25 million acres in Washington, Oregon, and northern California with a common, collaborative approach. The Record of Decision for the Plan amended regional guidelines and the planning documents for 19 National Forests and 7 Bureau of Land Management Districts. The management direction in the Record of Decision consists of detailed Standards and Guidelines and specific land allocations comprising a comprehensive set of ecosystem management rules for three interrelated conservation strategies: aquatic, terrestrial, and socio-economic.

The Plan's management strategy also includes monitoring to determine how well it is working and whether the agency activities satisfy Plan goals and objectives. In December 1994, U.S. District Court Judge William L. Dwyer stated, "Monitoring is central to the [Northwest Forest Plan's] validity. If it is not funded, or done for any reason, the plan will have to be reconsidered." He added, "If the plan as implemented is to remain lawful the monitoring . . . steps called for by the ROD will have to be faithfully carried out, and adjustments made if necessary."

The Record of Decision (page E_1) explains that implementation monitoring ". . . ensures that management actions meet the prescribed standards and guidelines and that they comply with applicable laws and policies." It also notes that the Plan calls for three components of monitoring: implementation, effectiveness, and validation. "Monitoring will . . . determine if the standards and guidelines are being followed (implementation monitoring); verify if they are achieving the desired results (effectiveness monitoring); and determine if the underlying assumptions are sound (validation monitoring)."

Additionally, the Record of Decision indicates that "Monitoring will be conducted at multiple levels and scales . . . to allow . . . information to be compiled and considered in a regional context." Although both the Bureau of Land Management and the Forest Service have extensive experience with monitoring, particularly at the project scale, they have done little monitoring at broader scales or in areas of the size and scope covered by the Plan.

Fiscal Year 2000 marked the fifth year of regional_scale Plan implementation monitoring. The Program's purpose is to determine and document whether the Plan and its Standards and Guidelines are being consistently followed across the Plan's range. The Program operated under the direction of the Regional Interagency Executive Committee until 1999, when the interagency Monitoring Program Managers became responsible for directing and overseeing all Plan monitoring.

Monitoring results provide the public and public officials with feedback about how well particular activities meet management objectives. The monitoring is iterative and adaptive to help determine whether the Standards and Guidelines are being complied with, if deficiencies are found in implementing them, and if corrective actions are needed. The results may lead to adjustments in actions by management agencies.

Relation of Implementation Monitoring to Other Monitoring

Three different types of monitoring are required under the Plan: implementation, effectiveness, and validation. This report evaluates implementation monitoring where the sampling was at the 5th-field watershed scale and reported at a regional scale. Determining compliance with Record of Decision direction across all land allocations in the Plan through monitoring serves as an important baseline for both effectiveness and validation monitoring. Implementation monitoring also documents actual management practices as they are carried out by field units, thus providing an important link between line officers and Plan implementation.

Various agency units monitor projects and activities within and outside the scope of the Plan at multiple scales and for a variety of purposes. For example, monitoring may address local issues of public interest, management actions not covered by the Plan direction, and land-use plan requirements. This report does not address monitoring for these other activities nor for effectiveness or validation monitoring.

The Approach to Implementation Monitoring

Overview. After the Record of Decision was signed in 1994, an interagency work group attached to the Research and Monitoring Committee of the Regional Ecosystem Office was assigned to design the Plan's monitoring approach. The group's work culminated in the release of a Final Draft Implementation Monitoring Guide in May 1995. The work group chose to systematically evaluate conformance with the Record of Decision through a strategy that emphasized an interagency, interdisciplinary approach and included members of the public.

To review monitoring activities systematically, a pilot program was initiated in FY 1996; it sampled agency timber sales in the Plan provinces. At the direction of the Regional Interagency Executive Committee, FY 1997 activities for formal review were expanded to include not only timber sales but also road building and restoration projects. The FY 1998 program called for monitoring timber sales along with an informal feasibility inquiry into watershed_scale activities. Six watersheds (five key and one non-key) were examined (two per state). The watershed_scale implementation monitoring approach tested out sufficiently and, in FY 1999, was expanded to 12 5th-field watersheds (one per province). In FY 2000, 24 watersheds were selected for watershed- scale implementation monitoring.

Sample selection. The Plan’s creators expected that landscape assessments such as watershed analyses, Late-Successional Reserve Assessments, and Adaptive Management Area Plans would be used to guide land management decisions. These assessments would be used to assist in integrating federal land and resource management across the landscape. The 2000 watershed-scale Program was designed to evaluate how well integrated planning and management were being implemented across the Plan area.

As in previous monitoring efforts, 2 fifth-field watersheds per province (24 total) were randomly selected. The FY 2000 Program used a questionnaire to guide the monitoring teams’ efforts. The watershed questionnaire contained both “compliance” questions to provide an assessment of how well specific Standards and Guidelines were met and questions designed to reveal the progress of implementing the plan.



Results

Land Ownership and Allocations

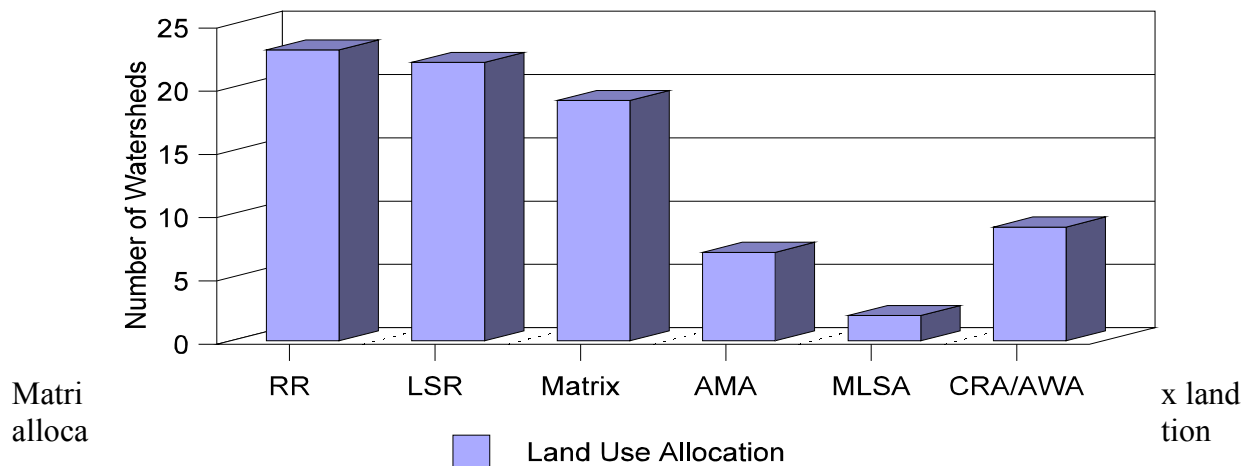
Watershed Statistics (question 1a). Lands in the 24 sampled watersheds included those under federal, State, and private management. For 18 of the 24 watersheds, most lands fell under federal management, primarily the Forest Service and the Bureau of Land Management, although the National Park Service and Army Corps of Engineers were also represented. In six watersheds dominated by non federal lands, primary ownership rested with large private timber companies, the states of Oregon and Washington, and individuals.

The largest watersheds sampled were the Upper Yakima River watershed (Yakima Province), 191,466 acres; the Nestucca watershed (Oregon Coast Province), 164,512 acres; and the Upper Cowlitz watershed (Southwestern Washington Cascades Province), 155,456 acres. The smallest watersheds sampled were the Rock/Three Mile Creek watershed (Deschutes Province), 34,551 acres; Trail Creek watershed (Southwest Oregon Province), 35,306 acres; and Middle Green River watershed (Western Washington Cascades Province), 38,974 acres. The average watershed size in the sample was 86,117 acres.

For lands managed by the Forest Service and the Bureau of Land Management, overlapping allocations were reported for all sampled watersheds. The Middle Green River watershed reported the most land allocations (Matrix, Adaptive Management Area, Riparian Reserve, Late-Successional Reserve, Managed Late-Successional Area, Congressionally Reserved Areas, and Administratively Withdrawn Area). Examples of Administratively Withdrawn Area and Congressionally Reserved Area allocations include Mount Thielson Wilderness, Smith River National Recreation Area, and Little Deschutes Wild and Scenic River Corridor.

Data on the acreage of the various land allocations were reported for 23 of the 24 watersheds. One report indicated that Matrix and Riparian Reserves had not been mapped for the watershed. Riparian Reserve allocations were reported for all sampled watersheds and Late-Successional Reserve allocations were reported for 22 watersheds. Matrix allocation was reported for 19 watersheds. Four of the watersheds not containing Matrix contained lands allocated as Adaptive Management Area; three additional watersheds also contained such allocations. Managed Late-Successional Areas were reported for two watersheds. Nineteen of the watersheds reported containing Congressionally Reserved Area and/or Administratively Withdrawn Area allocations.

Watersheds and their Land Use Allocations



comprised from 1% to > 80% of those watersheds that contained this allocation. The Adaptive Management Area allocation comprised from 10 to nearly 65%. Late-Successional Reserve allocation comprised from <1 to >80 % of those watersheds that contained these allocations.

The Riparian Reserve land allocation sometimes constituted the major land allocation in a watershed. For example, in one watershed 46,564 acres of Riparian Reserve were reported which comprises 53% of the total Forest Service lands in the watershed; in another 17,543 acres of Riparian Reserve were reported which comprises nearly 51% of the total Forest Service and Bureau of Land Management lands in the watershed. Conversely, in several watersheds < ten% of such lands were identified as Riparian Reserve.

Applying land allocation Standards and Guidelines (question 1b). The field units always reported that the most restrictive land allocations are applied first. Many of the units reported using direction from the Record of Decision for applying land allocations, and sometimes the units reported that more restrictive land allocations are found in Forest Plans or Bureau of Land Management Resource Management Plans.

Late-Successional and Old-Growth Habitat (question 2)

Definition of Late-Successional and Old-Growth Habitat. Stand age, average tree diameter, and stand structure were all listed as criteria for identifying late-successional and old-growth habitat. The most commonly used criteria were stand age and average tree diameter. Stand structure was listed as an important criterion for identifying late-successional and old-growth habitat, but these data were not commonly available because they are difficult and expensive to collect.

The typical definition of old-growth is having trees > 250 years old and > 21 inches dbh (diameter at breast height); late-successional habitat is defined as trees between 80 and 250 years old and between 9 and 21 inches dbh. As would be expected, the Provinces reported different ages at which a stand moves from late-successional to old-growth habitat. For example, the southern Provinces indicated that 180-200 year old or older stands are classified as old-growth habitat and northern Provinces state that stands >160 years old are classified as old-growth habitat.

Amounts of Late-Successional and Old-Growth Habitat. The methods for estimating amounts of late-successional and old-growth habitat differed greatly between Provinces. Usually, late-successional and old-growth habitat were reported separately; sometimes, however, the groups were combined and reported as late-successional habitat. Problems with comparability of Bureau of Land Management and Forest Service data were reported for one watershed, so only Bureau's data were reported.

The five watersheds with the largest acreage of late-successional habitat ranged from 25,957 to 41,682 acres. The six watersheds with the least late-successional habitat ranged from 491 to 4,742 acres.

For the six units reporting the most old-growth habitat, the acreage ranged from 14,998 to 34,723 acres. The least old-growth habitat were reported for two watersheds where wildfire destroyed all the old-growth trees in the sampled watersheds. In each of three other watersheds, <1000 acres of old growth habitat was reported.

The total acreage of late-successional and old-growth habitat provides one measure of these forest types, but the ratio of these habitats to the total acreage of Forest Service and Bureau of Land Management lands in a watershed provides a different perspective. The four watersheds

with the largest percentages of late-successional habitat ranged from a high of 81 to a low of 48%. The lowest ratio of late-successional habitat to total agency land ranged from 2 to 18% in 10 sampled watersheds. The six watersheds with the largest percentages of old-growth habitat ranged from a high of 81 to a low of 34%. Conversely, the lowest ratio of old-growth habitat to total agency land ranged from 0.4 to 18% for nine watersheds monitored.

Fourteen of the fifteen watersheds sampled that contained Matrix land allocations complied with the Standards and Guidelines requiring retaining old-growth fragments in watersheds where little remains (C-44). One of the watersheds in the Eastern Cascades Province reported that wildfire destroyed all but about 9% of the late-successional habitat in the watershed. The other watershed in that Province reported that wildfire destroyed all except 15.5% of the late-successional habitat in the watershed. One watershed with Matrix allocation provided no data on late-successional and old-growth habitat.

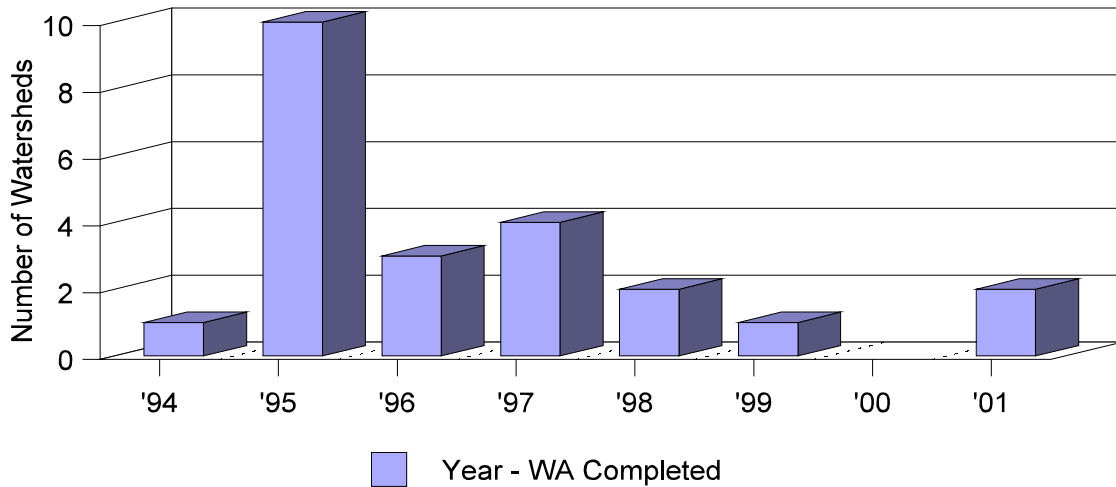
Late-Successional and Old-Growth Habitat Estimation Methods. Aerial photos and satellite imagery were the major sources of vegetation data for a particular watershed. These vegetation data were interpreted by categories (that is., grasslands versus forests), and the forest types were grouped by size and age classes. Geographical Information Systems (GIS) were used to compile and summarize the vegetation data and to generate reports for amounts of late-successional and old-growth habitat. Sometimes, the late-successional and old-growth data reported by the administrative units was taken directly from completed watershed analysis reports or Late-Successional Reserve assessments, but these data were also derived in the same manner.

One Province reported using data provided through a satellite imagery study from Oregon State University. The two northern California Provinces reported using 1981 vegetation plot data grown to 1998 by using the computer program, "Forest Vegetation Simulator". These data were then categorized into late-successional and old-growth habitat by applying the "Wildlife Habitat Relationship Classification System". Regardless of the method reported, the interpreted data were not field verified.

Watershed Analysis

Watershed Analysis Reports (questions 3a-c). Watershed analysis, or a similar process, was completed for all or portions of 21 of the 24 watersheds monitored. Watershed analyses are in progress for two of the remaining watersheds, to be completed during 2001. For the remaining watershed, a landscape assessment was completed in 1998. For the 21 watershed analyses completed watershed analysis, one was in 1994; ten in 1995; three in 1996; four in 1997; two in 1998; and one in 1999. None of the 21 reports had been updated, but one is being updated, and another is proposed for updating in 2001.

Watershed Analyses Completed by Year



Use of Watershed Analysis Reports. For projects before and after the Record of Decision (questions 3d-f), a series of questions was designed to gather information on compliance or progress with implementing the Standards and Guidelines to evaluate, by watershed analysis, existing activities and facilities to ensure they meet and do not prevent meeting the Aquatic Conservation Strategy objectives. The questions also are intended to determine if the watershed analysis reports contain adequate information to assist the decision-maker in determining if new and existing management activities and facilities are consistent with the Aquatic Strategy objectives.

Most watershed analyses (15 reports, 71%) did not discuss, or poorly discussed, if certain activities, projects, and facilities existing before the Record of Decision met the Aquatic Strategy objectives. For projects, activities, and facilities implemented afterward, eight watershed analyzes (38%) were found to have a complete or a partial discussion on how these actions meet the objectives. Responses also indicated that 19 of the 21 watershed analyzes (91%) did not include adequate documentation for the decision-maker to determine if existing or new management activities were consistent with the objectives.

Activities that were not evaluated before the Record of Decision included off-road motorized vehicle use on developed and undeveloped trails, developed and dispersed recreation facilities, grazing, rock pits, current road systems in Riparian Reserves, and various activities authorized through Special use Permits.

The responses indicated that projects after the Record of Decision were generally designed to meet or exceed the Aquatic Strategy objectives, although they were not discussed in watershed analysis reports. The field units also reported that timber sales planned before the Record of Decision, but implemented after it was signed, were modified to meet those objectives. Additionally, the units reported that if an existing facility (such as recreation sites), or a portion of a facility, was included in a new project, that portion of the facility was evaluated for consistency with the Aquatic Strategy objectives.

The field units reported that watershed analysis was not perceived as the sole venue for determining consistency of activities, projects, and facilities with the Aquatic Strategy objectives.. Most responses showed that the National Environmental Policy Act (NEPA) was the major process used to evaluate projects, activities, and facilities for consistency with the Aquatic Strategy objectives. In some instances, the scope of the project determined whether the objectives were discussed in the NEPA document; for example, a few responses showed that large timber sale projects requiring an environmental assessment report included a discussion of the Aquatic Strategy objectives, but small projects did not always include a thorough analysis and may not have mentioned those objectives.

Questions 4a-c explored whether watershed analysis reports identify opportunities for watershed restoration; provide information from which watershed restoration strategies and priorities can be developed ; and provide information from which monitoring strategies and objectives can be developed.

All of the completed 21 watershed analyses identified opportunities for restoring watersheds, but they differed in the specificity of the opportunities identified. For example, one province reported that opportunities were identified in a “general manner”, but another analysis contained 19 pages of specific recommendations for restoring their watershed.

Sixteen of the units reported having monitoring strategies and priorities fully or partly developed based on information in the watershed analysis. Other sources of information were also used to develop monitoring strategies and priorities; for example one unit reported using the Clean Water Act to assist with the monitoring strategy and in developing priorities. Monitoring strategies and objectives were also developed through coordination with the Tribes, the agency research branch, and District-Forest sponsored monitoring.

Watershed Restoration and Activities

Restoration (question 4d). The units reported a wide array of restoration activities implemented, or ongoing, that have, or will, contribute to improved watershed condition and help attain Aquatic Strategy objectives. Road-related activities included stabilizing, decommissioning, and relocating roads; replacing culverts; removing bridges; and removing fill from road failures. In-stream-related activities included re-connection of stream channels and adding large wood to stream channels. Riparian Reserve activities included pre-commercial thinning; creating snag and coarse wood; under-planting; and improving the management of off-road vehicles. Additional restoration activities included revegetating landslides; closing rock pits; reintroducing fire; and controlling noxious weeds.

Unstable Areas (question 3g). Nearly all units affirmed that known unstable areas are included in Riparian Reserves. One unit reported relocating a road out of an unstable area. Conversely, one unit reported that existing roads in unstable areas in the watershed are kept open, although other activities are excluded. Another unit reported that hazard trees were removed in unstable areas and another reported light or non-ground disturbing activities (pre-commercial thinning, tree planting, and prescribed burning), on unstable areas. The Deschutes Province reported no unstable areas in the watersheds monitored.

Activities (question 3d). Responses to survey questions indicated a wide range of land and resource management activities in the sampled watersheds (Table 1). Considerable overlap was found in how activities were reported. For example, roads and timber-related activities were often reported under the category of risk reduction as well as under their respective categories. The most common activities reported were restoration (96% of watersheds), collection of special forest products (96% of watersheds), road-related activities (92% of watersheds), and fuelwood gathering (83% of watersheds).

Special forest products collected included burls, floral greens, Christmas trees and boughs, poles; beargrass, lichens, and mushrooms. Road activities included building new roads; decommissioning roads, obliterating, maintaining, and closing roads; controlling road-side weeds, and grooming snowmobile routes.

Table 1. Land and resource management activities on 24 watersheds

Activity	Watersheds with activity (number)	Watersheds with activity (%)
Riparian Reserve Timber Activities	16	67
Roading Activities	22	92
Risk Reduction	14	58
Salvage	16	67
Restoration Activities	23	96
Commercial and pre-commercial thinning	19	79
Regeneration Harvest	11	46
Mining	10	42
Grazing	12	50
Special Forest Products	23	96
Fuelwood gathering	20	83
Other	21	88

Timber harvest (regeneration harvest, commercial thinning, and salvage) after the Record of Decision was reported for 92% of the watersheds. Seventy-nine percent of the watersheds had commercial thinning activities; regeneration harvest was reported for 46%; salvage logging was reported for 67%; and all three timber-harvest methods were reported in 33%. Timber harvest activities in Riparian Reserves were reported in 67% of the watersheds.

Risk reduction activities were conducted in 58% of the sampled watersheds. These activities included prescribed burning, chipping, pre-commercial thinning, hazard tree removal, removing brush along roads, and reconstructing roads.



Mining for pumice and crushed rock were reported in 42% and grazing in 50% of the watersheds. Permitted livestock included sheep, cattle, and horses.

In the “other” category, 88% of the watersheds were reported to have some type of activity. Activities reported included irrigation ditches, water withdrawals, water transmission lines, and a water treatment plant; All Terrain Vehicle use; developed and dispersed recreation; horse endurance runs; Federal Energy Regulatory Commission re-licensing; radio towers; installation of electric power lines; and black powder and Civil War re-enactments.

Key Watershed (question 5a)

Fourteen Key Watersheds were identified; sometimes only a portion of the sampled watershed was identified as a Key Watershed. One sampled watershed contained two Key Watersheds. Some units reported the type of Key Watershed, but others did not, so determining the number of Tier I (fish) and Tier II (water quality) Key Watershed allocations sampled was not possible.

Timber Harvest (questions 5b-d). Timber was harvested in 8 of the 14 Key Watersheds (57%). Thinning and salvage were the primary prescriptions for timber harvest in Key Watersheds, though some regeneration harvest of carry-over projects from before the Record of Decision was reported. A total of 7,990 acres were reported harvested -- an average of 888 acres-- with a range between 30 and 4,400 acres.

Five of the eight Key Watersheds with timber harvest addressed this activity in the watershed analysis, or in the landscape assessment (Deschutes Province). A timber project in one watershed from before the Record of Decision was modified to be consistent with it. Two additional watershed analyses were reported to have discussed timber harvest generally, and for one of these watersheds the timber harvest was formally addressed in the Late-Successional Reserve and Managed Late-Successional Area assessment for the watershed. One of the Key Watersheds had not completed a watershed analysis.

Roads (question 5e-h). Priorities were mostly set for road activities through watershed analyses. Other methods reported were restoration programs analysis reports; an access and travel management plan; and a transportation plan. One unit responded that the designation “Key Watershed” indicated a high priority for roads restoration and decommissioning activities.

Twelve of the Key Watersheds contained Roadless Area land allocations. No new roads were built, nor were any planned, in these areas.

Information on road mileages was provided for 13 of the 14 Key Watersheds. One report stated there was not an accurately mapped inventory of roads in any of the watersheds on the Forest, and several other watershed reports provided only some of the requested information. In 1994, 2,006.5 miles of system roads were in 12 Key Watersheds. Since 1994, 9.6 miles of new system roads were reported for four of the Key Watersheds and 91.8 miles of system road decommissioning was reported for 10 Key Watersheds (Table 2). The total reduction was 82.2 miles of system roads, a 4 percent reduction in the 12 Key Watersheds (Table 2).

Table 2. Statistics for system roads in Key Watersheds, 1994 -1999

Activity	Watersheds (#)	Total (mi.)	Average (mi.)	Range (mi.)
1994 System Roads	12	2,006.5	167.2	12.6 - 528.6
New	4	9.6	2.4	0.3 - 6.6
Decommissioned	10	91.8	9.18	1.5 - 23.3
Improved or Restored	6	263.4	43.9	3.6 - 187.0

Data on non-system roads were reported for only six of the Key Watersheds. Discerning from the responses why non-system roads data were not reported by the other Provinces was impossible to determine. For the six Key Watersheds that provided non-system road data, the 1994 total was 192.1 miles (Table 3). Three Key Watersheds contained a total of 11.7 miles of new non-system roads, and four Key Watersheds contained 23 miles of non-system road decommissioning (Table 3), resulting in a total reduction of 11.3 miles -- a 5.9% reduction of non-system roads for the six Key Watersheds. No non-system road improvement and restoration were reported for any of the Key Watersheds.

Table 3. Statistics for non-system roads in Key Watersheds, 1994 -1999

Activity	Watersheds (#)	Total (mi.)	Average (mi.)	Range (mi.)
Non-System Roads existing in 1994	6	192.1	32	3 - 112
Non-System Roads since 1994	3	11.7	3.9	2 - 5
Decommissioned	4	23	5.8	0.3 - 17
Improved or Restored	0	0	0	0

* *Non system roads are those not managed as part of the Transportation Management System Riparian Reserves*

Widths (question 6a-c). Responses indicated Record of Decision default values were used to establish Riparian Reserve widths in the sampled watersheds. Riparian Reserve widths were not modified for all the Riparian Reserves in the sampled watersheds. In one watershed, however, widths of specific Riparian Reserves were increased for streams flowing through wide alluvial valleys; and another analysis reported modification of specific Riparian Reserves. National Environmental Policy Act documents (environmental assessments) for timber-sale projects were used to formally establish the new widths.

How well watershed analysis addressed the appropriate widths of Riparian Reserves for providing habitat for associated species (such as fish, mollusks, amphibians, lichens, fungi, bryophytes, vascular plants, American marten, red tree vole, bats, marbled murrelets, and northern spotted owls) was addressed through responses to question 6c. Fifteen watershed analyses contained affirmative responses to this question. The responses indicated that the Record of Decision defaults for Riparian Reserve widths were assumed adequate to meet these species' needs. Additionally, the responses indicated that the default values for Riparian Reserve widths were not changed because of lack of information about the species' ecological requirements. Responses indicated that three watershed analyses went into detail on the role of Riparian Reserves to meet the needs of specific groups of species.

Road Management Plans (question 6e-f). Several questions were designed to collect information on Riparian Reserve management, particularly roads in the Riparian Reserves. Question 6e asked if each existing or planned road in a Riparian Reserve was screened by using the Record of Decision criteria (RF-2a-g) to determine if it was consistent with Aquatic Strategy objectives. The units responded that new roads are evaluated based on their consistency with those objectives. Existing roads generally are not, however, unless they are associated with a project – that is, with restoration.

All sampled watersheds were found to have a no road management or transportation plan specifically for Riparian Reserves. Three reports indicated on-going efforts to complete road management or transportation plans that will address Riparian Reserves and the Aquatic Strategy objectives. Two watersheds were reported to have Standards and Guidelines in Forest Plans that provide direction for road management in Riparian Reserves.

Recreation

Recreation Activities (question 7a). Responses to questions related to recreation showed a wide range of activities in the sampled watersheds (Table 4). Fishing and hunting, the most common activities, were reported for all watersheds. Hiking and camping were reported for more than 90% of the watersheds; river rafting for 46%; and skiing and horse trails for nearly 80% (Table 4). Off-road vehicle use was reported for 83% of the watersheds and bicycle use for 79% (Table 4).



Table 4 Recreation activities occurring on 24 watersheds

Activity	Number of Watersheds in which the activity occurs	% of Watersheds with activity
Hiking Trails	2396	
Fishing	24100	
Camping (dispersed and developed)	2292	
Skiing (cross-country and downhill)	1879	
Horse Trails	1879	
Bike Trails	1879	
Off-highway or off-road vehicles	1983	
River Rafting	1146	
Hunting	24100	
Other	2292	

Watershed Analysis (question 7b-e). The responses showed that 18 watershed analyses contained no evaluation of whether recreation projects, programs, and facilities existing in the watershed before the Record of Decision are consistent with Aquatic Strategy objectives. Three watershed documents partially analyzed of some existing recreation projects. Generally, these evaluations briefly described the recreation facility and may or may not have included some recommendations to better meet the Aquatic Strategy objectives. Several responses indicated that when an existing recreation facility was improved or modified, the changes were reviewed for consistency with Aquatic Strategy objectives. One watershed had no recreation facilities.

A similar finding was made for recreation facilities existing before the Record of Decision in Riparian Reserves. Twelve watersheds reported not evaluating these existing facilities for their consistency with the Aquatic Strategy objectives. Seven watersheds responded that their evaluation was limited, and two watershed analyses documented no recreation facilities in Riparian Reserves. Five units reported mitigation actions for recreation facilities in Riparian Reserves that negatively affected the Aquatic Strategy objectives, although the facilities were not discussed in the watershed analysis.

For recreation activities occurring after the Record of Decision, 10 watershed reports did not contain an evaluation of the activities' consistency with Aquatic Strategy objectives. In five watersheds reports, some such recreation projects were evaluated. Two reports did not contain a response to this question. None of the watershed analyzes evaluated a recreation program at the watershed scale.

Monitoring and Restoration (questions 7c-d). Restoration activities associated with recreation facilities were identified in 11 watersheds. Additionally, several responses indicated implementing recreation restoration activities. Examples of projects included relocating developed recreation sites out of Riparian Reserves, relocating trails away from stream banks, and enforcing the use of a boat ramp to reduce sedimentation.

None of the watershed analysis reports for the sampled watersheds identified monitoring of recreation programs, facilities, and projects. One unit reported that a monitoring plan found in their draft Wild and Scenic River Plan addressed dispersed camping and other recreational activities.

Survey and Manage and Protection-Buffer Species

Surveys (question 8d). The units reported protocol surveys for many Survey and Manage and Protection Buffer species. The following examples provide a sense of the many species included in protocol surveys: fungi -- *Bondarzewia montana*, *Oxyporus nobilissimus*, *Sarcosoma mexicanum* and *Otidea onotica*; lichens -- *Bryoria subcana*; bryophytes -- *Buxbaumia viridis*, *Ulota megalospora*, *Diplophyllum plicatum*, *Kurzia makinoana*, and *Ptilidium californicum*; vascular plants -- *Cypripedium montanum* and *C. fasciculatum*, *Botrychium* sp., *Allotropa virgata*, and *Coptis asplenifolia*; mollusks -- *Prophysaon coeruleum*, *P. dubium*, *Crytomastix devia*, *Deroceras hesperium*, *Hemphillia malonei*, and *Megomphix hemphilli*; amphibians -- *Plethodon elongatus*, *Plethodon vandykei*, and *Plethodon larselli*; and vertebrates -- *Strix nebulosa* and *Arborimus longicaudus*.

Component 1 and Protection-Buffer Species (question 8a-b). Responses indicated that 20 watersheds had Component 1 and Protection-Buffer species. One watershed did not respond to the question. For the other three watersheds, one response indicated that no surveys were conducted; for the other two watersheds, some surveys were conducted, but no Survey and Manage species were found.

For those watersheds with Survey and Manage species, the number of species in the watershed ranged from 1 to 14, although not all responses provided complete lists. Examples of species reported included mollusks – *Prophysaon dubium*, *P. coeruleum*, and *Hemphillia malonei*; bryophytes – *Buxbaumia viridis*, *Tetraphis geniculata*, and *Ulota megalospora*; vascular plants –

Allotropa virgata and *Sarcosoma mexicana*; lichens – *Lobaria hallii* and *Pseudocyphellaria rainierensis*; vertebrates -- *Picoides albolarvatus*, *Strix nebulosa*, *Otus flammeolus* and *Arborimus longicaudus*; and amphibians – *Plethodon elongatus*.

The number of Known Sites varied widely among watersheds and most often depended on the post Record of Decision projects in a watershed; that is, Known Sites were typically discovered through project scale surveys with specific protocols. For example, one response indicated that currently > 300 Known Sites for several species of mollusks are in the watershed, but before the protocol surveys there were no Known Sites for these mollusk species. Several Known Sites for plant species were determined from historical records. Watersheds with no projects generally had no Known Sites.

Known Site Management (question 8c). For seven watersheds with Known Sites, the species' Management Recommendations were followed in managing them. Six watershed analyzes reported not having any planned projects, and six additional analyzes reported avoiding or modifying projects with Known Sites. For one watershed, Known Sites were included in the 15 % retention areas wherever possible.

Record Keeping (question 8e-f). The units reported using various data storage methods for Survey and Manage records. For 9 of the 17 watersheds, Survey and Manage data are stored in the Interagency Species Management System database. For the remaining watersheds, one or more of the following storage methods is being used: local data bases, survey forms, survey results reports, NEPA documents (Biological Evaluations and Environmental Analysis), Geographical Information System, and maps.

Only one Province reported submitting annual status reports of species to the Regional Ecosystem Office. The status reports were for *Cyripedium* species, *Lobaria hallii*, and *Monadenia churchi*.

Late-Successional Reserves (question 9a-b).

Nineteen of the twenty-two watersheds with Late-Successional Reserve allocations had a completed assessments for either the large reserve or groups of unmapped reserves of 100 acres in the watershed. The allocations were not in Trail Creek and Middle Cispus watersheds. One unit responded that a Forest reserve assessment is in progress for the sampled watershed, and another unit reported that an assessment for a group of nine unmapped reserves of 100 acres is currently planned.

Habitat improvement projects were implemented in twelve of the watersheds with Late-Successional Reserve allocations. These projects were designed to improve conditions for fish, wildlife, watersheds, and late-successional habitat. Examples of projects to improve or accelerate developing late-successional habitat include timber stand improvements (that is, pre-commercial thinning), commercial thinning, and creating large woody material. Fuels reduction projects such as prescribed burning were implemented to reduce wildfire risk in Late-Successional Reserves. Projects to improve fish habitat included pre-commercial thinning to accelerate developing mature riparian forest stands, riparian planting, and placing large wood in streams. Watershed improvement projects included stabilizing slopes, replacing culverts, decommissioning or relocating roads, removing bridges, replacing trail-bridges, eradicating

noxious weeds, and a land exchange.

Responses also indicated that some projects were implemented without the express purpose of improving Late-Successional habitat, or benefitting related species. The projects were reported to have been designed to meet Late Successional Reserve Standards and Guidelines. One response indicated that the activities allowed (that is, All Terrain Vehicle use) were actually detrimental to the reserve.

Discussion

Results of the 2000 Implementation Monitoring program indicate that the Plan's Standards and Guidelines sampled are being met to a high degree across the sampled watersheds.

Extrapolating these results suggests the sampled Standards and Guidelines are being met across the entire Plan area. Implementation monitoring results also showed several areas of difficulty in implementing specific Standards and Guidelines. The areas of concern are not directly related to project implementation, but are specific to Standards and Guides for watershed analysis; the Aquatic Conservation Strategy compliance analysis for recreation facilities, activities, and programs existing before the Record of Decision; and preparing a road management or transportation plan for Riparian Reserves that will meet the Aquatic Strategy objectives.

Watershed Analysis and Compliance with the Aquatic Conservation Strategy

The responses to monitoring questions about the use of watershed analysis (questions 3e-f and 7d-e) indicated a wide variation on how the field units perceive and use watershed analysis (Appendix B). The concerns relate to the Record of Decision direction found on page B-10 for use of watershed analysis to report site specific Aquatic Strategy compliance of post- and certain pre-Record of Decision projects, activities, and programs (question 3e); provide adequate information for the decision maker to determine if proposed and certain existing projects, activities, and programs are consistent with the Aquatic Strategy objectives (question 3f); provide enough information for recreation projects, programs, or facilities planned or implemented since 1994 for the decision maker to determine that the project or management action meets or does not prevent attaining the Aquatic Strategy objectives (question 7d); and provide evaluation and mitigation for existing recreation facilities in Riparian Reserves, if any, to ensure they do not prevent and to the extent practicable contribute to attaining Aquatic Strategy objectives (question 7e).

Below is direction from the Record of Decision and the rationale for using watershed analysis and its tie to the Aquatic Strategy [B-20-34]:

- The standards and guidelines are designed to focus the review of proposed and certain existing projects [roads, grazing, mining and recreation] to determine compatibility with the Aquatic Strategy objectives. [B-10]
- The decision maker will use the results of watershed analysis to support the finding meets and does not prevent attainment of the Aquatic Conservation Strategy objectives. [B-10]
- The intent is to ensure that a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives. [B-10]
- The standards and guidelines provide for . . . managing roads, grazing, mining and recreation to achieve objectives of the Aquatic Conservation Strategy. [B-17]
- Watershed analysis is one of the principal analyses that will be used in making decisions on implementation of the Aquatic Conservation Strategy. [B-20]

- Watershed analysis provides the contextual basis at the site level for decision makers to set appropriate boundaries of Riparian Reserves . . design road transportation networks that pose minimal risk . . . [B-22]
- Watershed analysis plays a key role in the Aquatic Conservation Strategy, ensuring that aquatic system protection is fitted to specific landscapes.
- The information from the watershed analyzes will contribute to decision making at all levels. Project-specific National Environmental Planning Act planning will use information developed from watershed analysis.

Recreation and Compliance with the Aquatic Conservation Strategy

Responses to question 7b indicated high non-application of Record of Decision direction that recreation projects, programs, and facilities existing in the watershed before 1994 be reviewed in the watershed analysis to determine whether they meet, and do not retard or prevent attaining the Aquatic Strategy objectives (C-34, S&G RM-1 and RM-2). The responses to question 7b indicated that for all the watershed analyses sampled, none had analyzed of **all** pre-Record-of-Decision recreation projects, programs, and facilities in the sampled watershed (Appendix B). Only 10 percent of the watershed analyses had included analyzing compliance with the Aquatic Strategy for **some** pre-Record-of-Decision recreation projects, programs, and facilities.

Road Management Plan for Riparian Reserves

The responses to question 6e indicated poor response in addressing Standards and Guidelines for preparing road management or transportation plans for existing roads in Riparian Reserves. Responses indicated that none of the units have completed such analyses, although three units reported on-going preparation of a road management or transportation plan for the watersheds.

In the case of all three areas where meeting Standards and Guidelines is a concern (watershed analysis, recreation projects and programs in riparian areas, and road management in riparian areas), the possible causes are likely a combination of: 1) a perception that analysis is not required, 2) the watershed analysis guidelines and other direction do not contain specific instructions on timing or extent of coverage and 3) the watershed guidelines and other instruction are considered optional. For example, the Record of Decision does not state a deadline when the analyses must be completed or revised, the extent of what had to be covered, nor that watershed analysis was the only analytical tool that could be used to provide necessary and sufficient information to the decision maker. Field units have typically prepared first generation watershed analyses to cover existing conditions, known areas of concern, and anticipated projects. They are usually updated when an anticipated project or activity is not covered in the original analysis or when an existing project or activity becomes a concern. In addition, many units use other analytical tools such as Environmental Analyses and unit-wide transportation management plans to provide information to decision makers so they can determine necessary compliance with Aquatic Conservation Strategy Objectives.